

# Cost-effective use of biomass - A comparison between two model based studies

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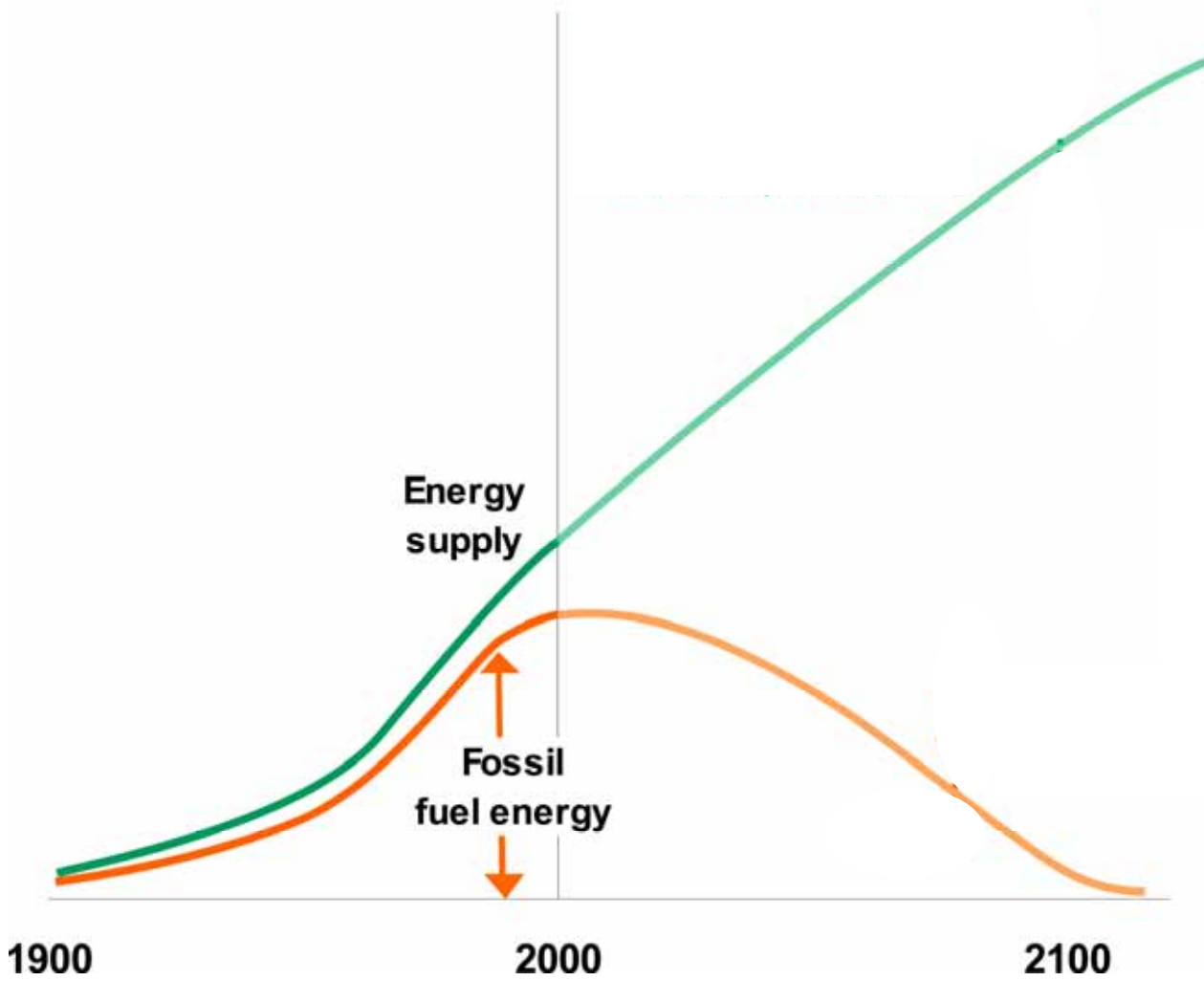
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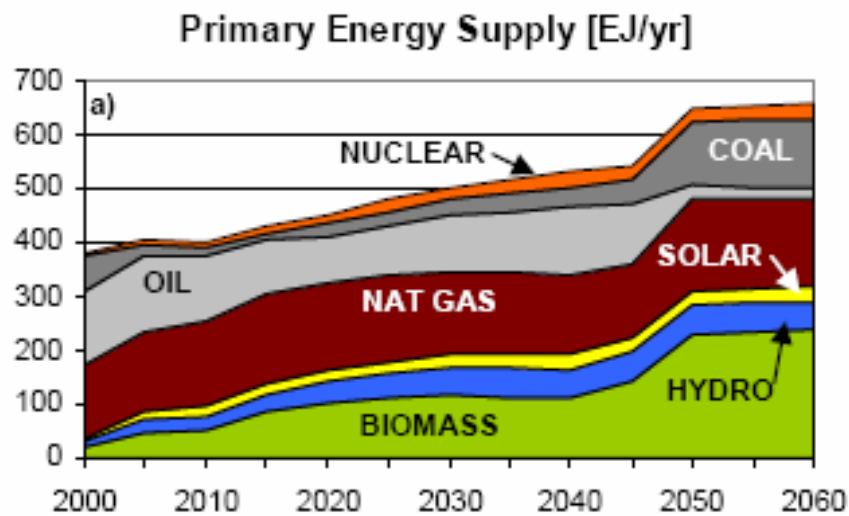
Two different research groups have developed their own global energy economy model to analyze how CO<sub>2</sub> emissions can be reduced at lowest cost

BEAP – Dolf Gielen, International Energy Agency (IEA), Paris

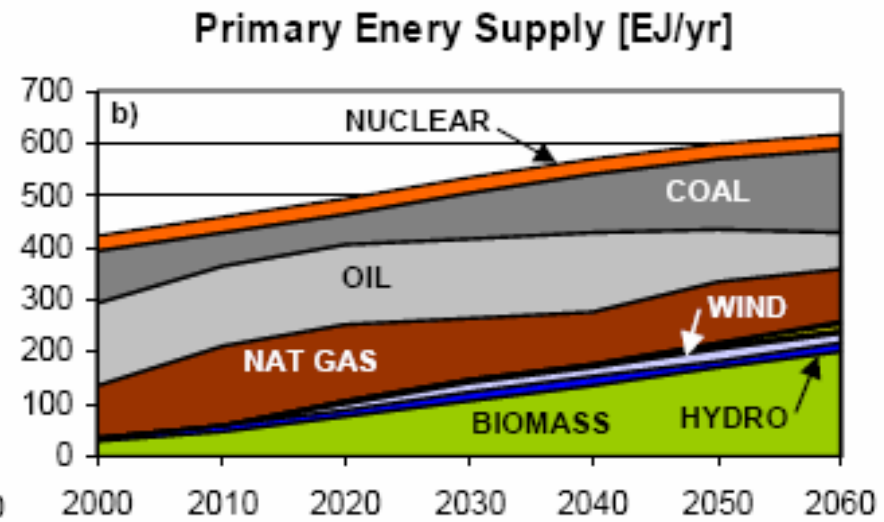
GET – Azar & Lindgren, Chalmers, Göteborg



# BEAP and GET 400 ppm scenarios



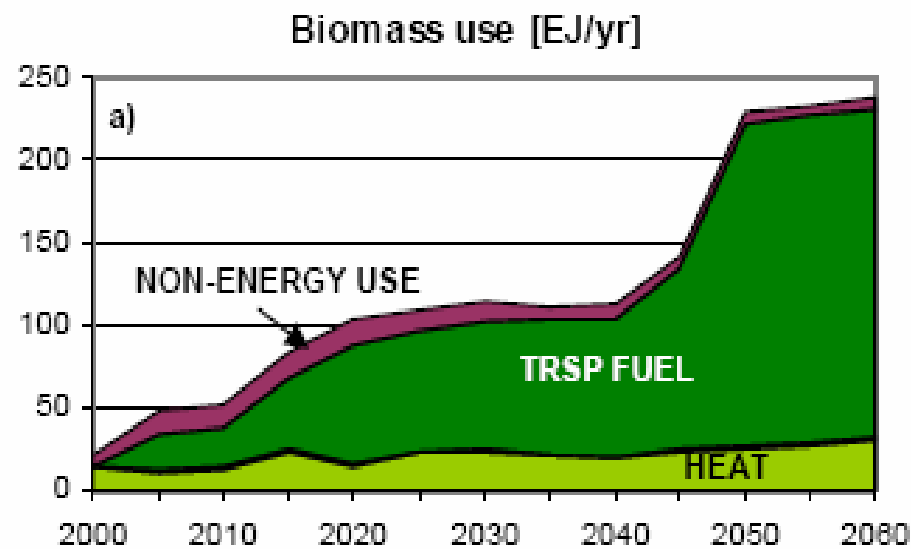
BEAP



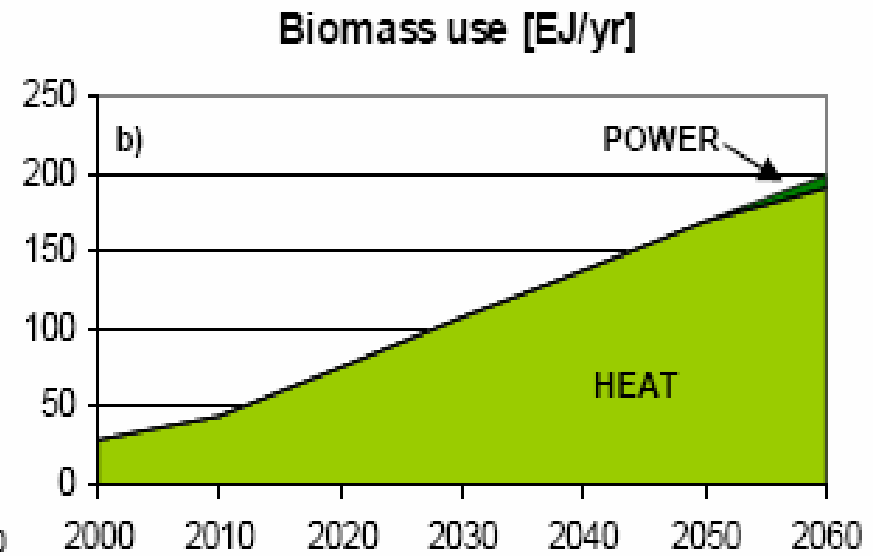
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# BEAP and GET 400 ppm scenarios



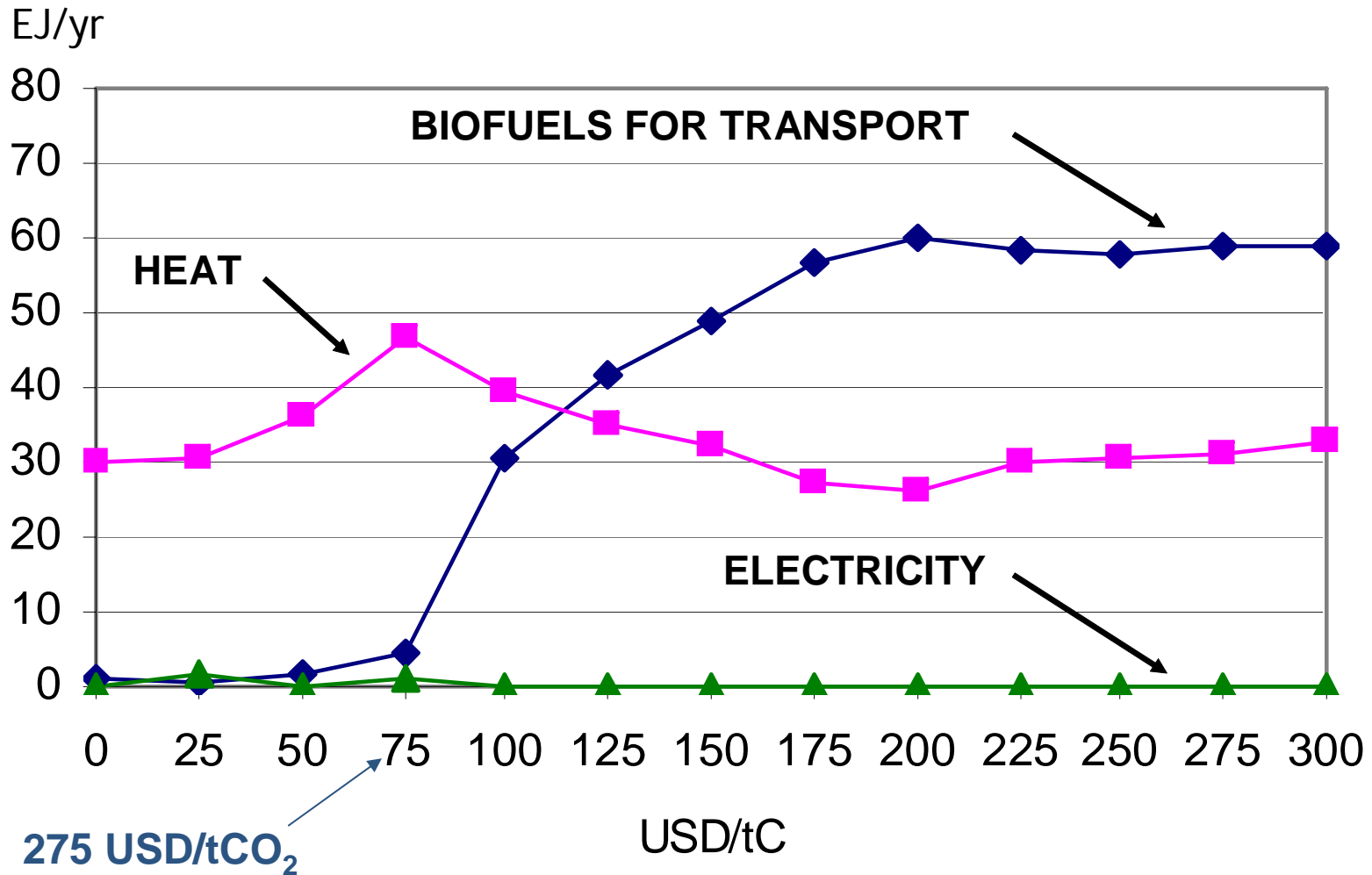
BEAP



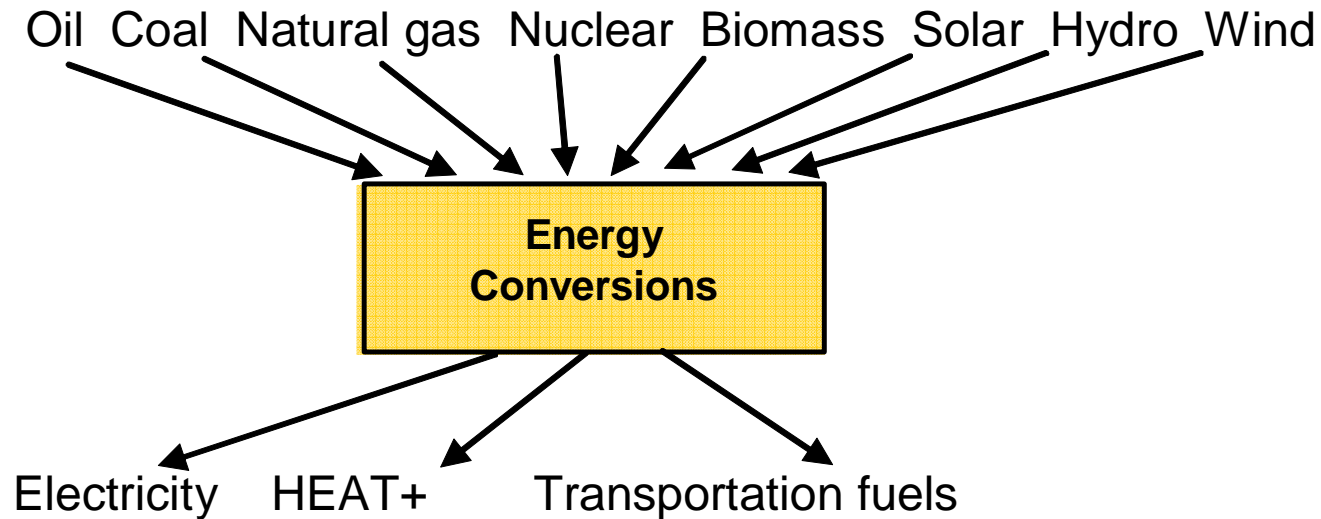
GET



# The biomass use (primary energy) in the BEAP model for various CO<sub>2</sub> taxes, year 2020



# Basic flow chart of supply and fuel choices in both energy system models.



	BEAP	GET
Gasoline/diesel	X	X
Gasoline/diesel via HTU-oil (biomass based)	X	-
Methanol	X	X
Ethanol	X	-
Fischer-Tropsch diesel	X	-
Hydrogen (fossil fuel based)	X	X
Hydrogen (CO2-neutral)	-	X
Natural gas	-	X

# Conclusions

- Biomass is most cost-effectively used for heat productions at "low" CO<sub>2</sub> taxes, up to about 75 USD/tC in both models (depends on year analyzed).
- The sector in which biomass is most cost-effectively used at higher CO<sub>2</sub> taxes depends on assumed possible energy carriers and technologies and cost assumptions on them.
- It is currently too early to determine the cost-effective long run fuel choice, in the transportation sector. If hydrogen/electricity options do not become available at sufficiently low costs, then biomass will have to enter in order to bring down overall energy and transport related emissions to low levels.



# Policy implications

Since it still is an open question if hydrogen/electricity options will become available at sufficiently low costs, policies at present should primarily aim at trying to bring down costs for both the biofuels option and the hydrogen/electricity option.

